

Application No. 08/941,132  
Attorney Docket No. 649-619P

*Sub 32*  
*cont*  
Claim 19. The process according to claim 10, wherein the deproteinized natural rubber has a nitrogen content of less than 0.02 % by weight.

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**REMARKS**

Upon entry of the above-amendment, claims 1-3 and 7-19 are pending in the present application. Support for new claims 11 and 12 can be found in claim 1, as originally filed. Support for new claim 13 can be found in claim 6, as originally filed. Support for new claim 14 can be found in Table 1. Support for new claims 15, 16, 18 and 19 can be found in claims 2 and 3, as originally filed. Support for new claim 17 can be found in lines 7-11 of page 21. No new matter has been added, and there is no need for a further search.

**Restriction Requirement**

During the Interview on March 2, 1999, the Examiner realized that he had inadvertently included claims 9 and 10 in the Office Action dated February 5, 1998 (and thereafter); therefore, the Examiner has reinstated the restriction requirement in accordance with the restriction requirement dated

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April 16, 1996. The claims have been separated into the following groups.

**Group I.** Claims 1-3, 7 and 8, drawn to a modified natural rubber.

**Group II.** Claim 9, drawn to a process of graft polymerizing modified natural rubber.

**Group III.** Claim 10, drawn to a process of epoxidizing modified natural rubber.

During a telephone conversation on March 10, 1999, Applicant's representative elected Group II comprising claim 9 with traverse. Applicants affirm the election of Group II with traverse, and submit that new claims 11 and 13-16 should be included with Group II.

Applicants find the course of events to be disconcerting, i.e., the effective withdrawal and subsequent reinstatement of the restriction requirement. It is unclear how much time and money could have been saved on this application, should things have progressed in a more typical fashion. Therefore, Applicants

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respectfully request the restriction requirement be withdrawn and claims 1-3, 7, 8 and 10 be rejoined.

### Rejections Under 35 USC 103

In view of the above-election of claims 9, 11 and 13-16, the rejection is rendered moot of claims 1-3 and 7-10 under 35 USC 103(a) as being unpatentable over Yasuyuki et al EP 584,597 taken with Kondo et al US 4,208,490, Burlett et al US 5,118,546 or Hayashi et al US 4,528,340. However, Applicants submit that the process claims 9, 11 and 13-16 are not made obvious by the cited references in view of the following considerations.

Applicants respectfully submit that unobviousness can reside in the discovery of the cause of a problem, the solution of which employs a combination of old elements. *In re Sponnoble* (CCPA 1969) 160 USPQ 237.

Applicants have identified and solved a problem associated with either grafting or epoxidizing *natural* rubber with a high efficiency or epoxidation ratio, respectively. The problem with grafting the natural rubbers is that the proteins, naturally occurring in the rubber, adversely affect the grafting and epoxidation process, thereby reducing the efficiency. Since there is no teaching or suggestion by any of the cited

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references that proteins found in natural rubber reduce the efficiency of either grafting or epoxidizing natural rubber, then it logically follows that none of the cited references teach the unexpected advantages effected by deproteinizing the natural rubber prior to grafting or epoxidizing. A result not suggested by the prior art can impart patentability to a process whose manipulative steps are within the skill of the art. *In re Kaplan* (CCPA 1940) 45 USPQ 175.

Yasuyuki et al teach that the advantages of deproteinizing natural rubber include: i) elevating the green strength, ii) preventing allergic reactions, iii) lowers water absorptivity of the rubber, iv) improves electrical characteristics, v) improved mechanical properties, vi) improved crepe characteristics, vii) improved aging resistance, and viii) stabilizes the vulcanizing characteristics. There is no teaching or suggestion by Yasuki et al that proteins found in natural rubber will adversely affect the grafting or epoxidation of the natural rubber.

At most, the combination of Yasuyuki et al with Kondo et al, Burlett et al and Hayashi et al teach either the epoxidation or graft copolymerization of natural (nonmodified) rubber. The cited references, when taken singularly or in combination, neither teach nor suggest that the efficiency of the epoxidation or graft copolymerization of natural (nonmodified) rubber can be

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improved by removing the naturally occurring proteins prior to the epoxidation or graft copolymerization step.

The Examiner's attention is directed to Tables 1-3 on pages 20, 22 and 25 of the specification, respectively. The advantageous results effected by deproteinizing the natural rubber prior to grafting are clearly shown in Tables 1 and 3. The "N content" is the weight percentage of nitrogen, which is an indirect measure of the amount naturally occurring proteins in the natural rubber. It is clear that as the protein content decreases, the graft ratio increases, i.e., the percent of monomers which are grafted to the main chain backbone of the rubber polymer increases. Likewise, the epoxidation ratio increases as the protein content decreases as shown in Table 2.

Thus, if a prima facie case of obviousness existed, which it does not, Applicants submit that the advantages afforded by the present process are truly unexpected, and as such would rebut any presumption of a prima facie case of obviousness. Applicants respectfully request the rejection be withdrawn.

#### **Conclusion**

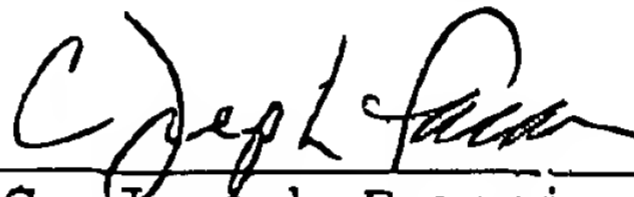
In view of the above amendments and comments, Applicants respectfully submit that the application is in condition for allowance. A notice to such effect is earnestly solicited.

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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.


Respectfully yours,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By   
C. Joseph Faraci  
Reg. No. 32,350

P.O. Box 747  
Falls Church, VA 22040-0747  
(703) 205-8000

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CJF/GMD:jls

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